From: "Kathy Godtfredsen" <KathyG@windwardenv.com>
To: "Hale, Elly" <Hale.Elly@epa.gov>
CC: "Tom Wang (twang@anchorqea.com)" <twang@anchorqea.com>
Date: 9/10/2020 10:03:07 AM
Subject: RE: Tier 2 analytical proposal is acceptable

OK – I will send an invite and we'll all you then. Thanks!

Kathy Godtfredsen, PhD
Windward Environmental, Partner
200 W Mercer St, Suite 401
Seattle, WA 98119
206.577.1283
kathyg@windwardenv.com

From: Hale, Elly <Hale.Elly@epa.gov>
Sent: Thursday, September 10, 2020 9:18 AM
To: Kathy Godtfredsen <KathyG@windwardenv.com>
Cc: Tom Wang (twang@anchorqea.com) <twang@anchorqea.com>
Subject: RE: Tier 2 analytical proposal is acceptable

I have a half hour at 11, Kathy – Give me a call then, and we can chat.

Elly Hale
US Environmental Protection Agency R10
1200 Sixth Avenue, Suite 155, M/S ***12-D12-1***
Seattle, Washington 98101-3188
(206) 553-1215
hale.elly@epa.gov

From: Kathy Godtfredsen <KathyG@windwardenv.com>
Sent: Wednesday, September 9, 2020 4:00 PM
To: Hale, Elly <Hale.Elly@epa.gov>
Cc: Tom Wang (twang@anchorqea.com) <twang@anchorqea.com>
Subject: RE: Tier 2 analytical proposal is acceptable

Hi Elly – Thanks for your review of the Tier 2 tables and your thoughts below. Tom and I would like to follow up with you on a few of these items. Do you have any time tomorrow between 10:30 – 12 or after 2?

Also, I wanted to let you know that we will be providing Tier 2 analysis instructions to the labs this Friday at noon to meet the Sept 11 schedule. Please let me know if EPA has any final comments after your check-in with Jing, Alison, and Denice.

Thanks!

Kathy Godtfredsen, PhD
Windward Environmental, Partner
200 W Mercer St, Suite 401
Seattle, WA 98119
206.577.1283
kathyg@windwardenv.com

From: Hale, Elly <Hale.Elly@epa.gov>
Sent: Wednesday, September 9, 2020 12:54 AM
To: Kathy Godtfredsen <KathyG@windwardenv.com>
Cc: Tom Wang (twang@anchorqea.com) <twang@anchorqea.com>; Susan McGroddy <SusanM@windwardenv.com>; John LaPlante (jlaplante@anchorqea.com) <jlaplante@anchorqea.com>; Craig Hanson <CraigH@windwardenv.com>; Hoffman, Erika <Hoffman.Erika@epa.gov>; Kerns, Kristen NWS (Kristen.Kerns@usace.army.mil) <Kristen.Kerns@usace.army.mil>; allison.crowley@seattle.gov; afitzpatrick@geosyntec.com; dave.schuchardt@seattle.gov; debra.williston@kingcounty.gov; florer.j@portseattle.org; jeff.stern@kingcounty.gov; Joe Flaherty - Boeing (Joseph.L.Flaherty@boeing.com) <Joseph.L.Flaherty@boeing.com>; bahnick.k@portseattle.org; Kathy Godtfredsen <KathyG@windwardenv.com>; lindsey.e.mahrt@boeing.com; pete.rude@seattle.gov; Jing.Liu@ecy.wa.gov; aosullivan@suquamish.nsn.us; dtaylor@suquamish.nsn.us
Subject: Tier 2 analytical proposal is acceptable

Hi, Kathy ,

Thank you for sending the table of Tier 2 analyses following last week's meetings to discuss LDWG's proposal and EPA's feedback. I believe you captured what we agreed to, and ***EPA is not requesting any additional Tier 2 analyses at this time.*** I know that a final decision is needed for the labs by September 11, and my team concentrated on checking the table against our recollection. However, I noticed too late that some who attended the meetings didn't receive the information you sent Thursday afternoon before a long weekend. I would like to check with Jing Liu, Alison O'Sullivan, and Denice Taylor before EPA's final word.

You asked about **grain size analyses** and said LDWG is leaning on the side of not getting these data as they're not useful for design. I didn't discuss this with everyone on my team, but I think it is prudent to get grain size analyses for completeness: gaps in databases create confusion and it's not always worth what you save. The chemical data set will already be a patchwork that is hard to summarize. Grain size data can also help elucidate recovery category identification or TOC values. If LDWG does not do the analyses now, however, it can be done in Tier 3 if needed.

When we spoke earlier today, I noted that EPA was reviewing the dry weight concentrations of PCBs to see if that might affect our feedback on Tier 2 analyses. The Tier 2 analyses (and potential Tier 3 analyses) proposed are still acceptable. However, the dry weight PCB data do raise some questions.
Forty-two samples that did not exceed applicable RALs for the sampled interval had dry weight concentrations greater than 130 µg/kg PCBs, a concentration that roughly equates to 12 mg/kg OC (assuming 1.1 % TOC). Fifteen of these had dry weight concentrations greater than 240 µg/kg PCBs, which equates to 12 mg/kg OC assuming 2% TOC. With the exception of five 0-10 cm locations, the results greater than 130 µg/kg were for deeper intervals and were in Recovery Category 2/3 areas, so they didn't exceed the applicable PCB RAL of 65, 195 mg/kg OC (or higher). In most cases, the samples were in areas where another interval at the same location exceeded a RAL, were near another location with a RAL exceedance, or were near a location where Tier 2 analyses will shed additional light on the likely need for Phase 3 data (see list at end for further detail).

There were a few locations where this was not the case. EPA encourages LDWG to give careful consideration to locations which, though below the RAL, have elevated dry weight PCB concentrations. At least 11 locations were identified on the maps with EF values of 0.9 to 1, and we appreciate that LDWG has agreed to include some Tier 2 samples based on these values. Particularly those near areas that will be remediated, samples with results near the RAL or with elevated dry weight PCB concentrations suggest the potential for unexpected volume and associated cost increases if the RAL alone is used to delineate remedial areas. EPA also would like LDWG to consider the conceptual site model, future conditions, and recovery category boundaries, which have uncertainties. Could areas below RALs but with elevated PCBs, if exposed, eroded or disturbed in future, affect achievement of remedial goals? Please consider the following examples:

- **Location 144** – This location is near the new South Park bridge and has 334 µg/kg dw PCBs in the 0-60 cm interval. There aren't nearby similar samples. It looks like a shoaling area on the map but isn't identified as such on the table. At 28.1 mg/kg PCBs OC, it would exceed the Recovery Category 1 RAL of 12 mg/kg, but is below the applicable 0-60 cm RAL of 195 mg/kg OC. Could the bridge have changed the potential for local erosion? South of the bridge may be an area for Phase 2 sampling.

- **Location 162** –The sample is in a potential scour zone just outside a recovery category 1 boundary and adjacent to Boeing Plant 2. The 0-45 cm interval had dry weight PCB concentrations of 196.3 µg/kg but is below 12 mg/kg OC. This result was below the PCB RALs for 0-10 and 0-45 cm intervals. The area south of this sample may be appropriate for Phase 2 sampling due to potential erosion.

- South Park Marina locations – The 0-60 cm Tier 1 results are all below the RAL of 195 mg/kg OC, but all exceed 130 µg/kg dw PCBs, with the highest concentration (408 µg/kg dw PCBs) at SC167. Results for the 0-10 cm interval samples there are all lower than 42 µg/kg dw PCBs. With no RAL exceedances, no Tier 2 samples were recommended and the ROD doesn't require action. *Please add South Park Marina, Duwamish Yacht Club, and Slip 6 to the agenda for discussion at our next meeting.*
- **Location 359** near Delta Marine has 310 µg/kg dw PCBs in the 0-45 cm interval, is greater than 12 mg/kg OC but below the applicable RAL of 65 mg/kg OC. What conceptual model explains the dry weight concentration? We agreed that 358 didn't need analysis for Tier 2, but 358 might be a good choice for Tier 3 analysis of the 0-45 cm interval, regardless of the Tier 2 results from Location 360. Location 358 is downslope from 358 and close to the recovery category 1 boundary at the entrance to Delta Marine.

- **Location 421**, on the west side of the waterway near RM 4.9, had a dry weight concentration of 246 µg/kg PCBs in the 0-45 cm interval. This is unexpected given its distance from known sources on the east side. This doesn't exceed the RAL of 65 mg/kg OC for RC2 areas, but it suggests that this area is more contaminated than expected. In an area where sediments are said to be moving as bedload, consider the risk of sediments at Location 421 (and potentially other areas nearby) being eroded. It might be worth further characterization of nearby sediments in Phase 2.

In recent meetings, LDWG consultants have mentioned the use of kriging or inverse distance weighting (IDW) to define problem areas. I am not aware of prior EPA agreement to a particular method of drawing boundaries around remediation areas, though we have discussed drawing the line at the sample that doesn't fail a RAL. *Please add this topic to the agenda for our next meeting.*

EPA hopes that LDWG is not focused on minimizing the relatively low costs of chemical analyses or adhering to a bright line of RAL exceedance when insufficient characterization or under-inclusion of potential problems could risk construction surprises and cost overruns for LDWG and other participating parties. For example, **Location 228** is between two known problem areas at RM3.8. Though both intervals are below their applicable RALs per the ROD, the 0-45 cm interval has 218 µg/kg PCBs (dw). **Location 236** south of RM3.8 has dry weight concentration of 303 µg/kg PCBs in 0-10 (and arsenic just below RAL in 0-45). As you draft boundaries, consider whether scour or remediation in adjacent locations below the RAL but with elevated PCB concentrations could disturb or expose contaminated sediments, and whether a minor increase in excavation volumes could avoid future problems.

Below is a partial list (in concentration order) of Tier 1 samples with dry weight results greater than 130 µg/kg PCBs (dw)
IT308, IT313, IT302 – 873 ppb, 713 ppb, and 558 ppb, near Rhone Poulenc, known problem, should include in remediation area.
IT266 – 427 ppb, just north of Rhone Poulenc, RAL exceedance in 0-10.
SC167 – South Park Marina, see note (same for SC169, SC167, SC161, SC159, SC158, and SC154).
IT416 – 379 ppb, near Norfolk, RAL exceedance in 0-10
SC144 – 334 ppb, near South Park Bridge, see note.
IT359 – 310 ppb, Near Delta Marine, see note
SS236 – 303 ppb, Near RM3.8E , see note
IT415 – 294 ppb, RAL exceedance in 0-10
IT426 –289 ppb, Surface EF 0.9. Next to Norfolk – Confidence?
IT258 –259 ppb. Surface EF 0.92. North of Rhone Poulenc – Confidence?
SS142 – 256 ppb, next to BP2. 0-60 RAL exceedance
SC169 – 250 ppb, South Park Marina, see note.
IT421 – 246 ppb, West Side RM4.9. see note.
IT228 – 218 ppb. RM3.8, see note.
IT133 – 214 ppb. RAL exceedance in 0-10

Again, thank you, Kathy, for helping us grasp the Tier 1 results in orderly tables and figures.

Talk to you all soon,

Elly

Elly Hale
US Environmental Protection Agency R10
1200 Sixth Avenue, Suite 155, M/S ***12-D12-1***
Seattle, Washington 98101-3188
(206) 553-1215
hale.elly@epa.gov